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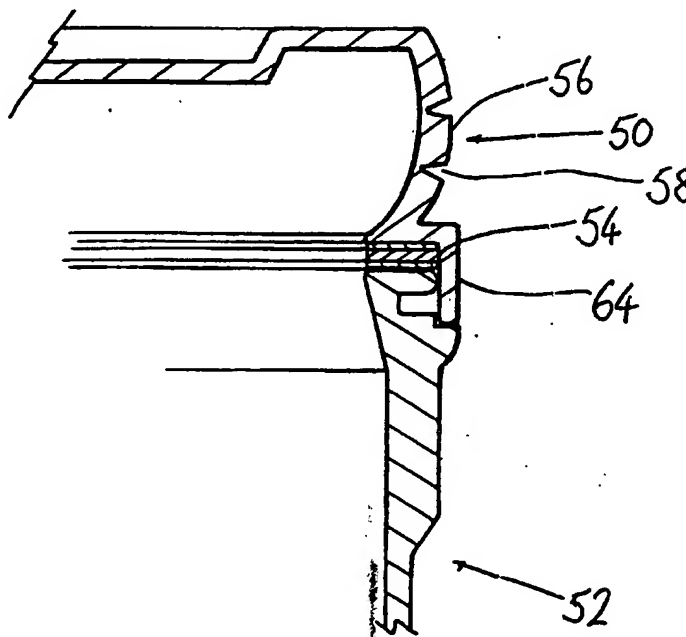
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(54) **Container comprising receptacle, sealing band and lid**

(57) A container is disclosed which comprises a receptacle (2,52,92) having an opening for emersion of contents and a lid which can be located on the receptacle to close the opening. In order to seal the lid to the receptacle a sealing band (18,54,70) with heat sensitive material on two opposed surfaces is positioned in a recess formed between the receptacle and the lid, extend-

ing around the opening. The band contacts both the receptacle and the lid so that application of heat causes the band to seal to both, forming a seal for the container. Opening means such as a tear strip are provided to enable a user subsequently to gain access to the contents of the container. The container is particularly well suited to being aseptically filled, e.g. with foodstuffs.

FIG. 4



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Description

[0001] The present invention is concerned with containers, particularly with containers which can be sealed once filled.

[0002] It is well known to hermetically seal containers for food products - e.g. pots, jars, cans or bottles of glass or polymer plastics - using a foil lid or cover which entirely covers the container opening. The foil has on one of its sides a polymer layer, and the container has a rim around its opening whose perimeter shape typically matches that of the foil. After filling of the container, the foil is placed over the opening with its polymer layer lying against the rim. The foil is then heated, by an indirect method, and is thereby effectively welded to the container rim producing an air tight seal to protect the container contents.

[0003] The process can be performed aseptically.

[0004] Typical food products for packaging in this way are milk and milk based products, soups, sauces and fruit juices.

[0005] This known type of package has certain shortcomings.

[0006] The foil lid/cover remains exposed and so vulnerable to puncturing or other physical damage during transit, handling and display. The air tight seal can be broken by such damage, exposing the contents to contamination e.g. by aerobic micro-organisms.

[0007] Opening is achieved by grasping, typically between thumb and forefinger, a foil edge or tab and peeling back the foil. Gripping and obtaining a clean pull on the tab can be difficult, and there is a tendency for the foil to rip, leaving behind a part of the foil which is then troublesome to remove.

[0008] A fully air tight seal is not always achieved between the foil and the container.

[0009] The present invention is intended to provide a container having a closure which reliably achieves a hermetic seal and is easy to open.

[0010] In accordance with a first aspect of the present invention, there is provided a container comprising a receptacle having an opening for insertion of contents, a lid engageable with the receptacle to close the opening, the lid and the receptacle being shaped such that when engaged they form together a recess extending around the opening, and a sealing band having heat sensitive material on two opposed surfaces, the band being positionable in the recess such that said two surfaces contact corresponding surfaces of the container and the lid respectively and such that application of heat causes the band to form a seal between the receptacle and the lid, the container wall having opening means whereby a user can gain access to the container contents.

[0011] The sealing band can provide a reliable, hermetic seal for the container.

[0012] It is preferably under compressive force between the lid and the receptacle during heating to assist in ensuring a full seal.

[0013] The sealing band is preferably formed as a loop of foil material coated on both its major surfaces with heat sensitive material. The heat sensitive polymer materials well known in connection with the above prescribed prior art containers are suitable. The foil is preferably metal.

[0014] Alternatively the sealing band may be formed by a peripheral portion of a sheet positionable across the opening.

[0015] It is particularly preferred that the container is aseptically filled and sealed.

[0016] Preferably, the receptacle and the lid are such as to form lock together. This eases assembly and can ensure that the band is appropriately squeezed during heating. In a particularly preferred embodiment, perimeter walls of the receptacle and the lid are such that one can be inserted into the other, form locking means being provided by a resiliently biased projection receivable in a complementarily formed recess. In one such embodiment of the present invention, the container is circular and the radially outer of the two perimeter walls has an integrally formed, radially inwardly projecting circumferential locking band, the radially inner of the two perimeter walls having a frusto-conical part followed by a circumferential recess, so that during assembly the locking band is stretched as it rides over the frusto-conical part and then snaps into the recess.

[0017] The opening means preferably comprise a tear away strip formed by a portion of the container wall. This strip may be in the receptacle wall or in the lid wall. It may be defined by pre-formed lines of weakness in the container wall. It is particularly preferred that a pull tab is coupled to the tear away strip so that the user can open the container by pulling on the tab.

[0018] The receptacle and/or the lid are preferably of plastics.

[0019] It is particularly preferred that the lid comprises polyethylene. This is a particularly suitable material for formation of a tear strip.

[0020] A great advantage made possible by the present invention is that the receptacle and the lid can be of different materials. If necessary, the sealing band, can comprise different heat sensitive materials on respective faces to seal to different materials of the receptacle and lid. Thus a polyethylene lid may be used with a receptacle comprising, e.g., polypropylene, glass, or even a known five layer structure having inner layers of EVOH resin and of polypropylene with exterior layers of polyethylene.

[0021] The heat sensitive material may comprise polyethylene. This can be used to seal to a polyethylene lid or base. Additionally or alternatively, polypropylene may be used.

[0022] A currently preferred embodiment has a polypropylene receptacle with a polyethylene lid, the sealing band having a polyethylene layer to seal to the lid and a polypropylene layer to seal to the receptacle.

[0023] The sealing band may have a multi-layer struc-

ture comprising metal foil layers on either side of a plastics core with outer layers of temperature sensitive material.

[0024] In a particularly preferred embodiment of the present invention, the lid defines a compartment and is provided with cover means for closing the compartment to thereby separate its contents from those of the receptacle, a tear off strip being formed in a wall of the container to allow the lid to be separated from the receptacle and access thereby to be gained to the contents of the lid and the receptacle. This construction can allow two different products to be presented together to the user, e.g., yoghurt and flavouring.

[0025] Specific embodiments of the present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:-

Fig. 1 is an axial section through a closed container embodying the invention;

Fig. 2 is an enlarged section, in the same plane as Fig. 1, through the portion of the same container which is encircled in Fig. 1.

Fig. 3 is a section corresponding to Fig. 1 but showing the container after opening;

Fig. 4 is an axial section through a further closed container embodying the present invention;

Fig. 5 is a perspective illustration of the Fig. 4 container;

Fig. 6 is a perspective illustration of the Fig. 4 container after opening;

Fig. 7 is a perspective illustration of a further closed container embodying the present invention;

Fig. 8 is a perspective illustration of yet a further container embodying the present invention, after opening; and

Fig. 9 is an axial section through a further closed container embodying the present invention.

[0026] The container illustrated in Figs 1 to 3 is particularly well suited to applications where the container is aseptically filled, and provides a hermetic seal.

[0027] It comprises a product receiving receptacle formed as a base 2 and fitted with an initially sealed lid 4. Both parts can be moulded plastics. In this embodiment, the lid is of polyethylene, chosen because it can be torn by the user, as will become clear. The base, however, is of polypropylene. Other materials can be used.

[0028] As Fig. 2 makes clear, the base and lid are shaped to form lock together. The lid has a circular, downwardly projecting skirt or wall 10 receivable over an upper part of a circular wall 5 of the base. The base wall 5 has a circumferential recess 6 for receiving a complementarily formed circumferential locking band 8 which projects radially inwardly from the lower edge of the wall 10 of the lid. Above the recess, the base wall 5 has an inclined circumferential shoulder 12 over which the locking band 8 rides as the two parts are pushed together, being thereby temporarily stretched until it

reaches, and snaps into, the recess 6.

[0029] The rim of the base wall 5 has an integrally formed circumferential lip 14 which projects radially inwardly and which supports on its upper edge a separately formed sealing band 15 which will be described below.

[0030] Above the rim of the base the lid has, integrally formed with its wall 10, a circumferential, radially inwardly directed projection 16 providing in its lower face, adjacent the lip 14, a downwardly open circumferential recess partly receiving the sealing band.

[0031] The sealing band 15 is thus sandwiched, and subject to compressive pressure, between the base and the lid.

[0032] The sealing band 15 comprises a foil ring 18 with polymeric material 19 on both its upper and its lower faces. In this particular embodiment, the materials match those of the base and lid - the upper layer of polymeric material is polyethylene and the lower is polypropylene. Assembly of the container, after filling thereof, involves pushing the base and lid together until they lock, the band 15 being trapped between the two parts, and then application of heat by indirect means to fuse the band's polymeric coverings to the adjacent surfaces of the container, reliably forming a hermetic seal. The entire process can be carried out aseptically.

[0033] To facilitate subsequent opening of the container, one of its walls has pre-formed circumferential lines of weakening defining a strip which can be torn away by the user. The lines extend around the whole perimeter of the container. In the illustrated embodiment these lines are in the wall of the lid, although they could instead be in the wall of the base. The lines of weakening are formed as a pair of circumferential nicks or cuts 20 part way through the lid wall. A pull tab 22 is attached to the tear off strip 24 between the cuts 20 and can be grasped by the user to pull away the strip, detaching the lid from the base and allowing access to the interior.

[0034] The container illustrated in Figs. 4, 5 and 6 is similar in many respects to that illustrated in Figs. 1 to 3, having a lid 50 and a receptacle formed as a container base 52, both of moulded plastics. A foil band 54 having polymeric material on both of its faces is received in a circumferential recess bounded by facing surfaces of the lid 50 and base 52 and is bonded thereto by the polymeric material as before. A tear off strip is seen at 56, being defined by weakening lines 58 which extend circumferentially around the lid. A pull tab integrally formed with the tear off strip is seen at 60. Looking at Fig. 6, showing the tear off strip 56 separated from the container after opening, it will be appreciated that the strip does not extend around the entire circumference of the lid. Instead a hinge section 62 is left between the two ends of the strip and keeps the lid 50 pivotally attached to the container base 52 once the tear strip 56 has been pulled away.

[0035] In the Figs. 4-6 container the lid 50 and container base 52 are not shaped to form lock together but

the lid has a skirt 64 which is received over the upper portion of the body 52 to align the two parts during assembly.

[0036] The container illustrated in Fig. 7 is the same as that illustrated in Figs. 4 to 6 except that the Fig. 7 version has no tear strip 56 but instead a tear off panel 66, defined in the upper face of the lid (again labelled 50 in Fig. 7) by weakening lines 67. Integrally formed with the tear off panel 66 is a pull tab 68 enabling the user to tear the panel away along the weakening lines to form an aperture for access to the container contents. This container can be particularly well adapted for use with food which requires heating. An initial pull on the tab 68 can cause it to puncture the lid 50, to vent steam during heating, without the panel 66 being torn away. When heating is complete the user can then tear off the panel 66 to gain access to the contents of the container.

[0037] The container illustrated in Fig. 8 is the same as that illustrated in Figs. 4 to 6 except that in this version there is provided a foil cover 70 covering the opening to the container 52. The foil cover lies beneath the lid 50 so that when, as in Fig. 8, the lid is lifted, the foil cover continues to close the container until the user tears it away. In this version the band which serves to bond the lid 50 and container body 52 is formed by the periphery of the foil cover 70, this peripheral part of the foil cover having polymer material on its upper and lower faces.

[0038] The container illustrated in Fig. 9 defines two separate compartments - an upper compartment 80 and a lower compartment 82 - and has various applications. For example a foodstuff such as yoghurt may be presented with flavouring in one compartment and natural yoghurt in the other, enabling the consumer to mix the two as desired.

[0039] The lid of the container is seen at 84 and itself defines the upper compartment 80 which is closed by a removable cover 86 lying across the lid and forming in this case a mechanical seal therewith. Various other possible constructions of the cover will suggest themselves to those skilled in the art - a flexible (e.g. foil) cover adhered in place is one such possibility.

[0040] Formed around the lower part of the lid 84 is a descending flange 87 in which are formed two perimetral lines of weakening 88 defining a tear off strip 90 which is formed similarly to that seen in Figs. 4 to 6 and enables the major portion of the lid, along with the cover 86, to be separated from the container base 92 defining the lower compartment 82.

[0041] The lid 84 and the container base 92 are formed by two separate plastics moulding but are joined, as described above with reference to earlier embodiments, by a polymer coated foil band 94.

[0042] The lower compartment 82 is closed by a removable cover 96, similarly formed to the cover 86.

[0043] In use of the Fig. 9 container, the tear strip 90 is first torn away to allow the lid 84 and the base 92 to be separated, giving access to the two covers 86, 96 which can then be removed to enable removal of con-

tents from the compartments 80, 82.

[0044] The above embodiments are presented as examples only of the manner in which the invention can be put into practice. Numerous other possibilities exist. For example, while the illustrated containers are of wide necked type, the invention is applicable to narrow necked containers, e.g. squeezable ketchup bottles. Also while the illustrated embodiments require the container to be torn to provide access to the container's contents, the container could utilise, e.g. a screw top of "flip top" (of the type seen on ketchup bottles) for this purpose, allowing the container to be opened or closed. Still a further possibility is a lid which is twisted through a part turn by the user to break the seal and allow removal of the lid.

Claims

1. A container comprising a receptacle (2, 52, 92) having an opening for insertion of contents, a lid (4, 50, 84) engageable with the receptacle to close the opening, the lid and the receptacle being shaped such that when engaged they form together a recess extending around the opening, and a sealing band (18, 54, 70) having heat sensitive material (19) on two opposed surfaces, the band being positionable in the recess such that said two surfaces contact respective surfaces of the container and the lid and such that application of heat causes the band to form a seal between the receptacle and the lid, the container having opening means (20, 22, 24, 56, 58, 60, 66, 68, 88, 90) whereby a user can subsequently gain access to the container contents.
2. A container as claimed in claim 1 wherein the sealing band is formed as a loop (18, 54) of foil material coated on both faces with heat sensitive material.
3. A container as claimed in claim 1 wherein the sealing band is formed by a peripheral portion of a sheet (70) positionable across the opening of the receptacle.
4. A container as claimed in any preceding claim wherein perimeter walls of the receptacle (2, 52, 92) and the lid (4, 50, 84) are such that one can be inserted into the other for engagement of the receptacle with the lid.
5. A container as claimed in any preceding claim wherein the receptacle (2, 52, 92) and the lid (4, 50, 84) are adapted to form lock together.
6. A container as claimed in claim 4 wherein the receptacle (2, 92) are adapted to form lock together by means of a resiliently formed projection (8) re-

ceivable in a complementarily shaped recess (6).

7. A container as claimed in any preceding claim wherein the opening means comprises a portion of a wall of the container serving as a tear off strip (24,56,90). 5
8. A container as claimed in any preceding claim wherein the opening means comprises a tear off panel (66) formed in the lid (50). 10
9. A container as claimed in claim 8 wherein the tear off panel is provided with a pull tab (68) by use of which the container can be punctured prior to tearing off of the panel (66). 15
10. A container as claimed in any preceding claim wherein the lid (4,50,84) and the receptacle (2,52,92) are of different materials, the sealing band (18,54,70) having different heat sensitive materials on respective faces to seal to the receptacle and the lid. 20
11. A container as claimed in any preceding claim wherein the sealing band comprises metal foil layers on either side of a plastics core with outer layers of temperature sensitive material. 25
12. A container as claimed in any preceding claim wherein the lid (84) defines a compartment (80) and is provided with cover means (86) for closing the compartment (80) to thereby separate its contents from those of the receptacle (92), a tear off strip (90) being formed in a wall of the container to allow the lid to be separated from the receptacle and access thereby to be gained to the contents of the lid and the receptacle. 30 35
13. A container as claimed in claim 12 wherein the receptacle (92) is provided with cover means (96) for closing the receptacle. 40

14. A method of packaging product comprising;

providing a container comprising a receptacle (2,52,92) having an opening for insertion of the product, a lid (4,50,84) engageable with the receptacle to close the opening, the lid and the receptacle being shaped such that when engaged they form together a recess extending around the opening; 45 50

inserting the product into the receptacle;

positioning in the recess a sealing band (18,54,70) having heat sensitive material (19) on two opposed surfaces, said two surfaces contacting respective surfaces of the container and the lid; 55

heating the band causing it to form a seal be-

tween the receptacle and the lid; and providing the container with opening means whereby a user can gain access to the product in the container.

15. A method as claimed in claim 14 wherein the sealing band comprises metal and is heated by application of electromagnetic radiation.

FIG.1

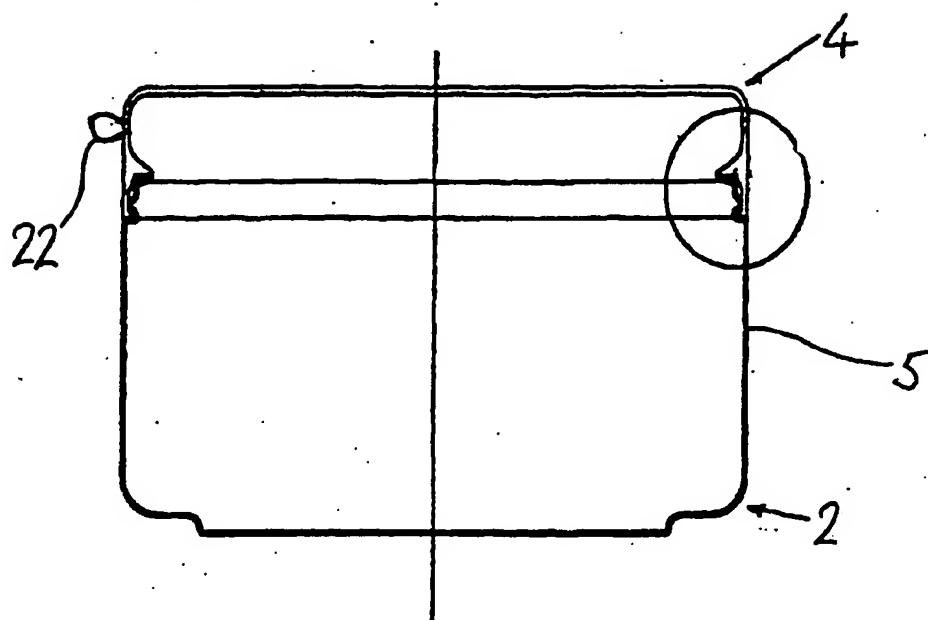


FIG.2

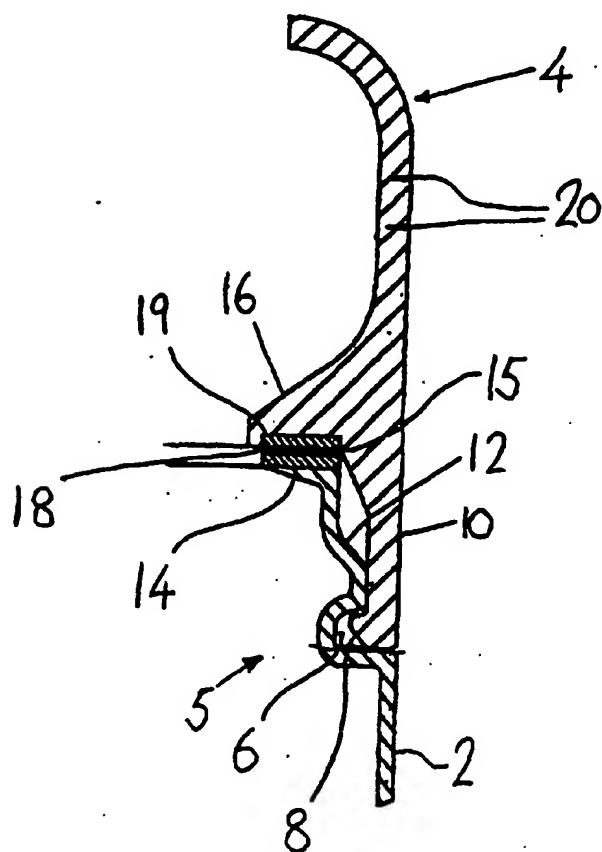


FIG.3

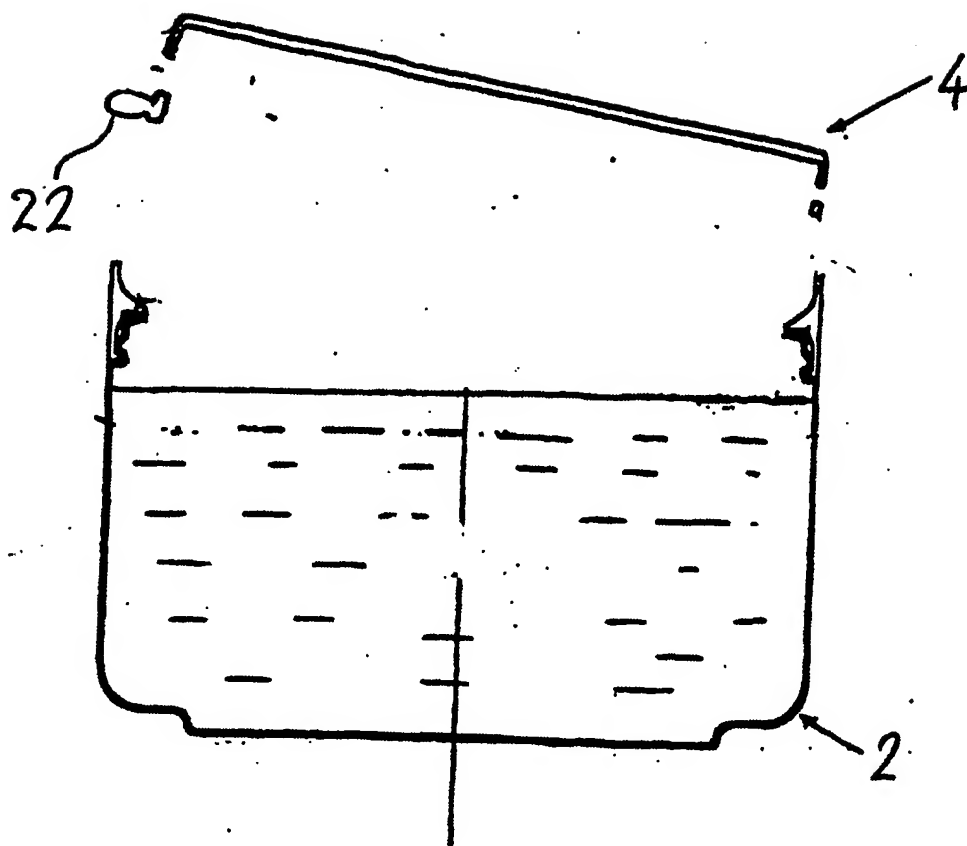


FIG. 4

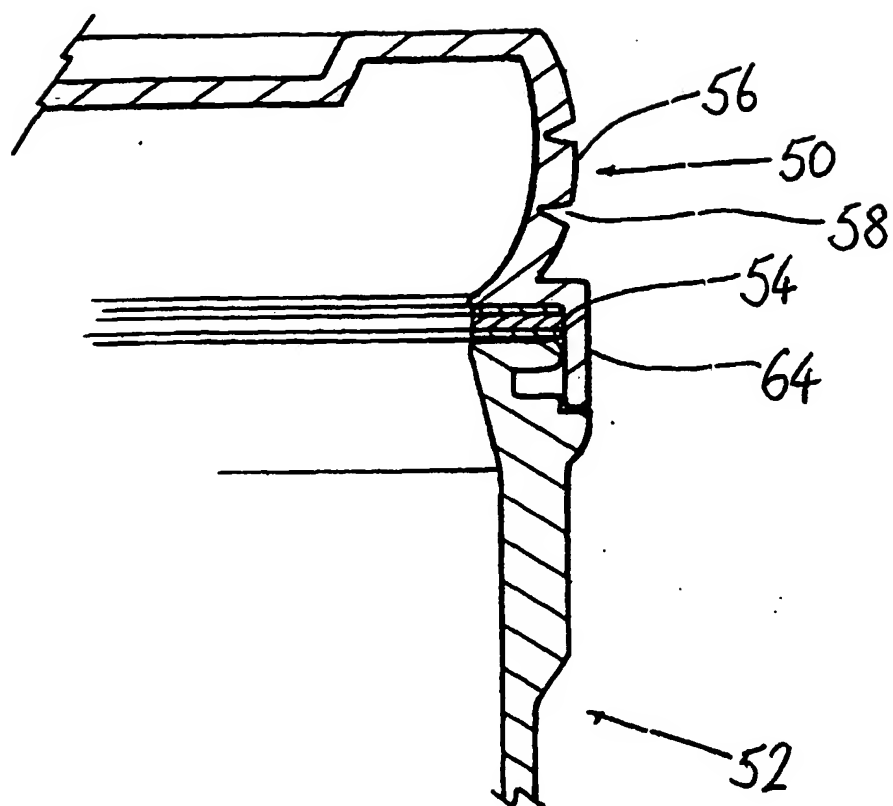


FIG. 5

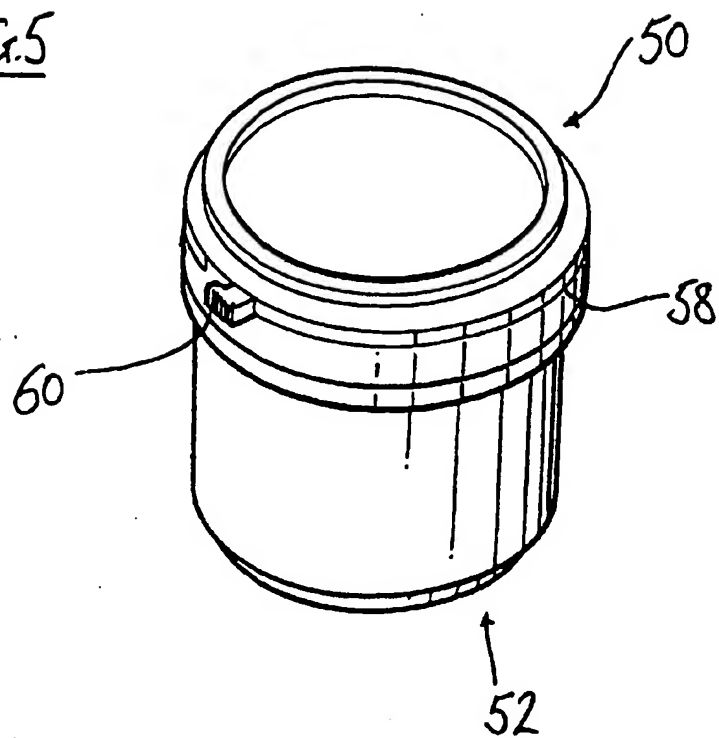


FIG. 6

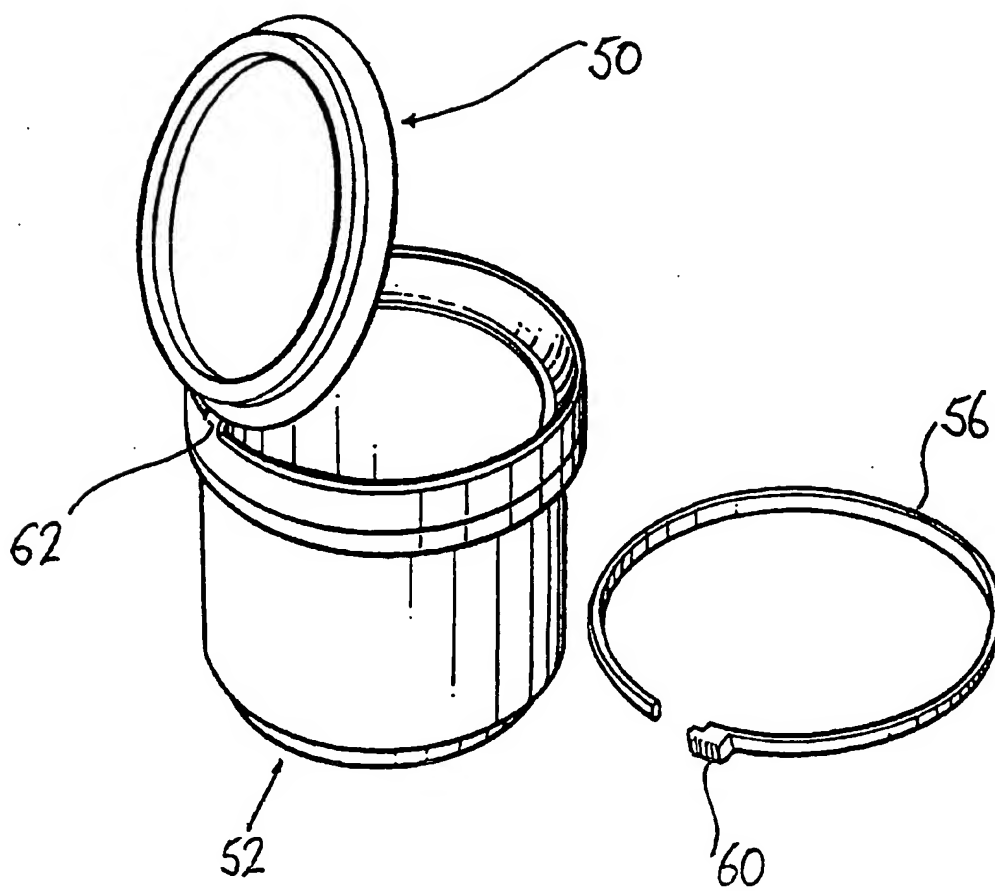


FIG. 7

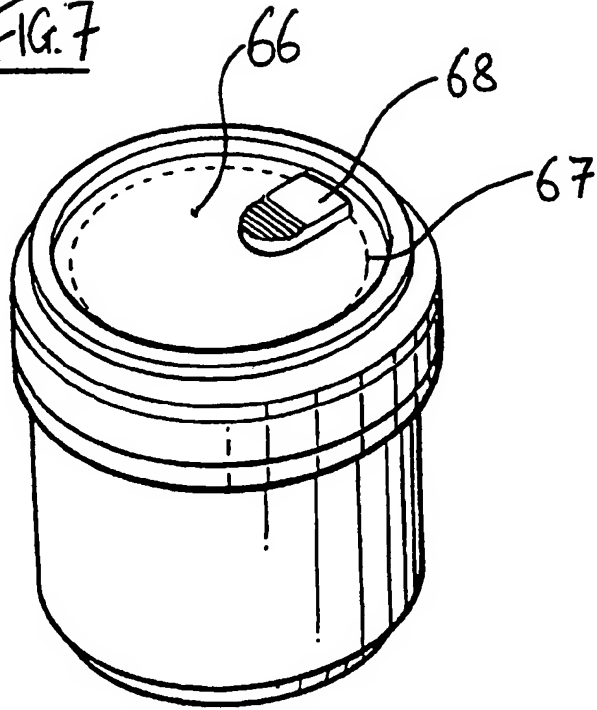


FIG. 8

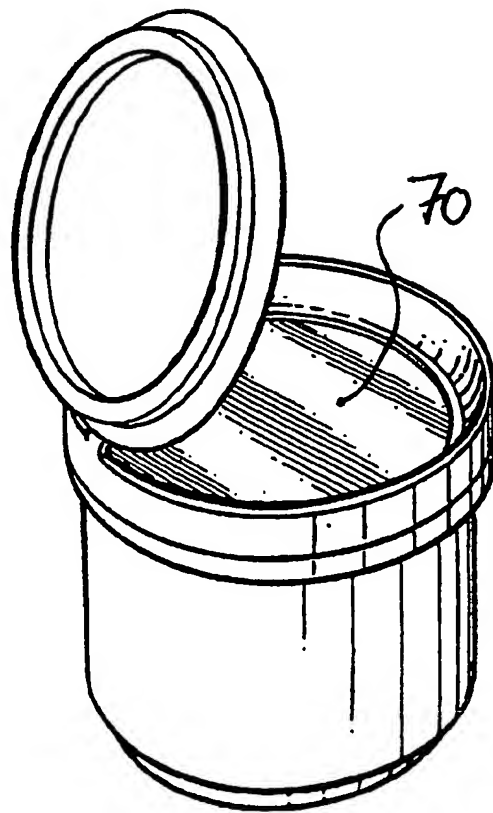
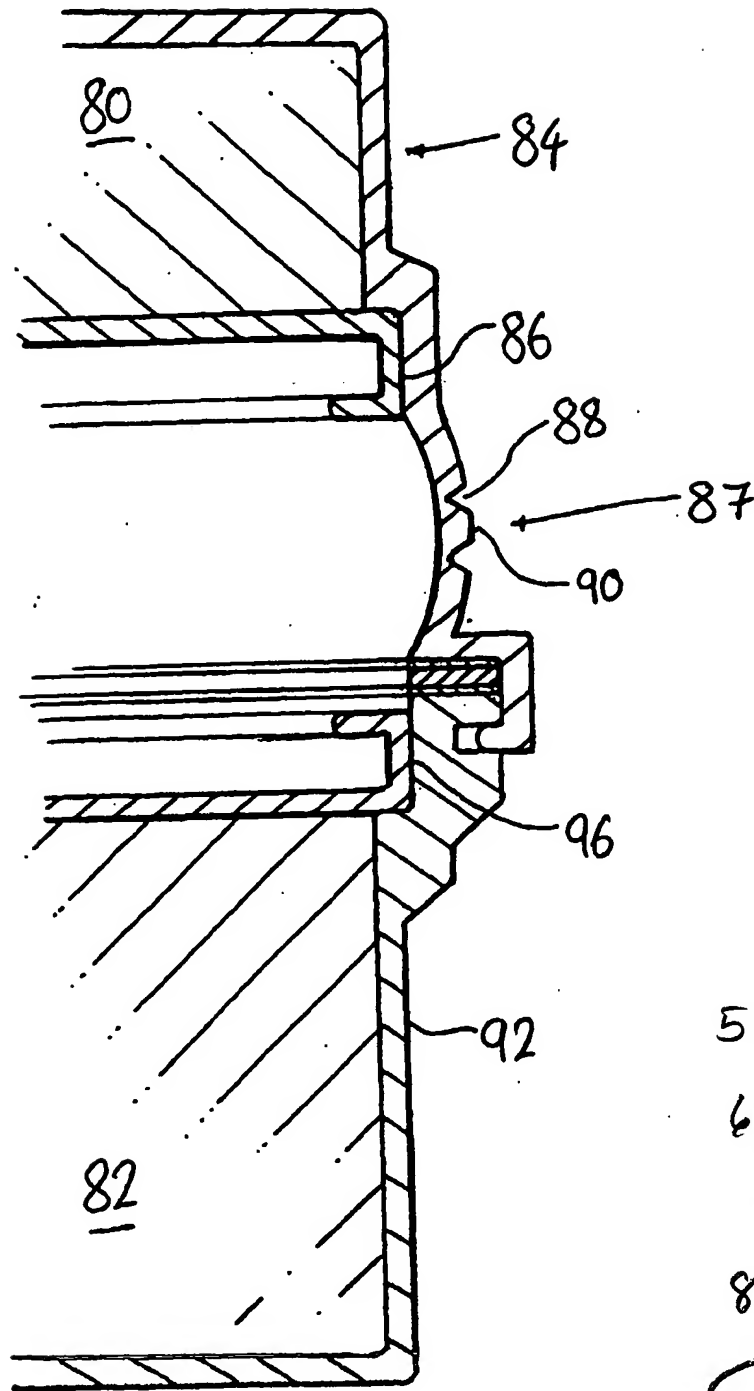


FIG. 9



from above



52, 53, 54, 60
62, 63, 64, 69
70, 77,
80, 81

103 79